



Admonter solid timber multi-layer products

Environmental product information for LEED v4.1® building certification

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Admonter 
NATURE'S FAVOURITE DESIGNER

This document aims at the identification of linkages between environmental product information covered by EPDs and the requirements of the LEED v4.1® building certification. It provides an overview of product related features based on the LEED v4.1 credit library [<http://www.usgbc.org/credits>, accessed on 08/2021, LEED BD+C: New Construction v4.1]

.product description

Admonter multi-layer products represent wooden elements, wooden acoustic elements and parquet flooring. The products consist of an inner core made of spruce, which is glued crosswise, and a layer of noble wood on top. The dimensions of single elements vary between a width of 100 and 2030 mm and lengths between 590 and 5000 mm with a product thickness of 10 to 42 mm. Top layers mainly consist of native wood species. As Admonter Holzindustrie AG does not use tropical wood species, a thermal treatment allows a similar design using native wood representing an ecologically preferable alternative.

.application

The use of Admonter multi-layer products mainly refers to indoor applications as flooring material (room class 1). Installation of Admonter products takes place floating or with the help of parquet glues. Admonter offer designated products for the use outdoors (places with protection against exposure; room class 2).

.technical data

The technical specifications for Admonter multi-layer products are made according to the following standards: *EN 14342* and *EN 13986*

The products are being delivered to the market with the appropriate CE mark and Declaration of Performance.

Name	Value	Unit
Wood moisture* acc. <i>EN 13489</i>	5-9	%
<i>EN 13353</i>	6-10	
Length (min. - max.)	0.59 - 5	m
Width (min. - max.)	0.1 – 2.03	m
Height (min. - max.)	0.01-0.042	m
Thermal conductivity* acc. <i>EN 14342</i>	0.12-0.17	W/(m K)
<i>EN 13986</i>	0.12-0.18	
Emissions of formaldehyde acc. <i>EN 717-1</i>	< 5	µg/m³
Emission of formaldehyde* acc. <i>EN 14342</i>	class E1	
<i>EN 13986</i>	class E1	
Emission of pentachlorinated phenol* acc. <i>EN 14342</i> and <i>EN 13986</i>	no PCP added	
Breaking strength acc. <i>EN 14342</i>	NPD	
Slip resistance acc. <i>EN 14342</i>	NPD	
Durability* acc. <i>EN 14342</i>	class 1	
<i>EN 13986</i>	class 1	
	class 2	

* product dependant

NPD = no performance determined. This property is not relevant for multi-layer parquet. Slip resistance does not follow harmonized requirements. National standards refer to various kinds of testing methods and must thus be checked on a national level.

.environmental product declaration

Owner of the declaration	Admonter Holzindustrie AG
Programme holder & publisher	Institut Bauen und Umwelt e.V. (IBU)
ECO-EPD at ECO platform	yes
Author of the LCA	Daxner & Merl GmbH
Software & database	GaBi software-system and database for life cycle engineering GaBi 10, database 2021.1 [see documentation]
Third-party verification	Completed; Type III declaration in compliance with <i>ISO 14025</i>
External verifier	Matthias Klingler
Declaration number	EPD-STI-20210176-IBC1-DE (Admonter Massivholzmehrschichtprodukte)
Issue date	23.07.2021
Valid to	22.07.2026
Declaration type	Manufacturer's declaration of an average product according to <i>EN 15804</i>
EPD specifications	The EPD was created according to the specifications of <i>EN 15804+A2</i> . Furthermore, the environmental indicators required by TraCi, which covers US conditions, are evaluated.
Declared unit	1 m ² of solid timber multi-layer products with a basis weight of 7.67 kg/m ² and a humidity of 7% at delivery.
Conversion factor to 1 kg	Admonter multilayer parquet and elements: 7.67
Reference period	With professional installation and care of the product, the service life of the product is 40 years according to the current BNB guidelines - BNB service life of building components (as of: 11/2011). This does not correspond to the reference service life according to <i>ISO 15686</i> .
End of life scenario	The end of life scenario for Admonter solid timber multi-layer products assumes energy recovery as secondary fuel. The energy recovery takes place in a biomass power plant. The scenario assumes a reprocessing rate of the multi-layer products of 100% after removal from the building.

.results of the LCA – environmental impacts acc. to EN 15804+A2

Declared unit: 1m ² of solid timber multi-layer product (7.67kg/m ²)							
Declared life cycle stage		Product stage	End of life stage				Benefits and loads beyond the system boundary
Indicator	Unit	A1-A3	C1	C2	C3	C4	D
GWP-total	[kg CO ₂ -eq.]	-7.68E+00	0.00E+00	2.32E-02	1.26E+01	0.00E+00	-7.15E+00
GWP-fossil	[kg CO ₂ -eq.]	4.79E+00	0.00E+00	2.30E-02	6.10E-02	0.00E+00	-6.66E+00
GWP-biogenic	[kg CO ₂ -eq.]	-1.25E+01	0.00E+00	-2.73E-05	1.25E+01	0.00E+00	-4.83E-01
GWP-luluc	[kg CO ₂ -eq.]	2.57E-02	0.00E+00	1.87E-04	8.63E-05	0.00E+00	-5.21E-03
ODP	[kg CFC11-eq.]	9.51E-08	0.00E+00	4.53E-18	1.46E-15	0.00E+00	-8.68E-14
AP	[mol H ⁺ - eq.]	3.16E-02	0.00E+00	7.61E-05	1.27E-04	0.00E+00	4.97E-03
EP-freshwater ¹	[kg P- eq.]	3.06E-04	0.00E+00	6.81E-08	1.64E-07	0.00E+00	-9.87E-06
EP-marine	[kg N- eq.]	1.18E-02	0.00E+00	3.49E-05	3.02E-05	0.00E+00	9.42E-04
EP-terrestrial	[mol N- eq.]	1.12E-01	0.00E+00	3.90E-04	3.17E-04	0.00E+00	1.14E-02
POCP	[kg NMVOC-eq.]	2.83E-02	0.00E+00	6.86E-05	8.18E-05	0.00E+00	4.27E-03
ADPE	[kg Sb-eq.]	4.46E-06	0.00E+00	2.03E-09	1.79E-08	0.00E+00	-1.22E-06
ADPF	[MJ]	7.44E+01	0.00E+00	3.05E-01	1.09E+00	0.00E+00	-1.17E+02
WDP	[m ³ World- eq. deprived]	5.44E+01	0.00E+00	2.13E-04	9.79E-03	0.00E+00	-1.71E-01

Caption

GWP – total = Global warming potential – total; GWP-fossil - Global warming potential - fossil fuels; GWP-biogenic - Global warming potential – biogenic; GWP-luluc - GWP from land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential; accumulated exceedance; EP-freshwater - Eutrophication, fraction of nutrients reaching freshwater end compartment; EP-marine - Eutrophication, fraction of nutrients reaching marine end compartment; EP-terrestrial - Eutrophication, accumulated exceedance; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE - Abiotic depletion potential for non-fossil resources; ADPF - Abiotic depletion potential for fossil resources; WDP - Water (user) deprivation potential, deprivation-weighted water consumption (WDP)

¹ Disclaimer: This indicator has been calculated as [kg P-equiv.] according to the characterization model of the JRC and Environmental Footprint Initiative.

.results of the LCA – resource use acc. to EN 15804+A2

Declared unit: 1m ² of solid timber multi-layer product (7.67kg/m ²)							
Declared life cycle stage		Product stage		End of life stage			Benefits and loads beyond the system boundary
Indicator	Unit	A1-A3	C1	C2	C3	C4	D
PERE	[MJ]	1.30E+03	0.00E+00	1.76E-02	1.27E+02	0.00E+00	-2.98E+01
PERM	[MJ]	1.28E+02	0.00E+00	0.00E+00	-1.26E+02	0.00E+00	0.00E+00
PERT	[MJ]	1.43E+03	0.00E+00	1.76E-02	5.00E-01	0.00E+00	-2.98E+01
PENRE	[MJ]	6.87E+01	0.00E+00	3.07E-01	6.23E+00	0.00E+00	-1.17E+02
PENRM	[MJ]	5.69E+00	0.00E+00	0.00E+00	-5.15E+00	0.00E+00	0.00E+00
PENRT	[MJ]	7.44E+01	0.00E+00	3.07E-01	1.09E+00	0.00E+00	-1.17E+02
SM	[kg]	2.47E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.26E+02
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.15E+00
FW	[m ³]	1.32E+00	0.00E+00	2.01E-05	4.87E-04	0.00E+00	-1.96E-02

Caption

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

.results of the LCA – output flows acc. to EN 15804+A2

Declared unit: 1m ² of solid timber multi-layer product (7.67kg/m ²)							
Declared life cycle stage		Product stage		End of life stage			Benefits and loads beyond the system boundary
Indicator	Unit	A1-A3	C1	C2	C3	C4	D
HWD	[kg]	2.95E-07	0.00E+00	1.62E-11	2.87E-10	0.00E+00	-2.62E-08
NHWD	[kg]	2.12E-01	0.00E+00	4.81E-05	7.70E-04	0.00E+00	4.43E-03
RWD	[kg]	5.52E-03	0.00E+00	5.56E-07	1.62E-04	0.00E+00	-9.61E-03
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	[kg]	0.00E+00	0.00E+00	0.00E+00	7.67E+00	0.00E+00	0.00E+00
EEE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Caption

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported energy, electric energy; EET = Exported energy, thermal energy

.results of the LCA – additional impact categories (optional) acc. to EN 15804+A2

Declared unit: 1m ² of solid timber multi-layer product (7.67kg/m ²)							
Declared life cycle stage		Product stage	End of life stage				Benefits and loads beyond the system boundary
Indicator	Unit	A1-A3	C1	C2	C3	C4	D
PM	[Disease Incidence]	4.40E-07	0.00E+00	4.32E-10	1.07E-09	0.00E+00	-1.90E-08
IRP	[kBq U235-eq.]	9.97E-01	0.00E+00	8.13E-05	2.65E-02	0.00E+00	-1.58E+00
ETP-fw	[CTUe]	1.32E+02	0.00E+00	2.27E-01	4.57E-01	0.00E+00	-2.72E+01
HTP-c	[CTUh]	3.38E-07	0.00E+00	4.58E-12	1.29E-11	0.00E+00	-2.91E-10
HTP-nc	[CTUh]	1.74E-07	0.00E+00	2.69E-10	4.88E-10	0.00E+00	2.91E-08
SQP	[-]	3.46E+03	0.00E+00	1.05E-01	3.42E-01	0.00E+00	-2.04E+01

Caption

PM = Potential incidence of disease due to PM emissions; IRP = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative toxic unit for ecosystems; HTP-c = Potential comparative toxic unit for humans – cancerogenic; HTP-nc = Potential comparative toxic unit for humans - not cancerogenic; SQP = Potential soil quality index

Disclaimer 1 – valid for indicator IRP:

This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – valid for indicators ADP minerals&metals, ADP-fossil, WDP, ETP-fw, HTP-c, HTP-nc, SQP:

The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator

.results of the LCA – environmental impacts acc. to TraCi

Declared unit: 1m ² of solid timber multi-layer product (7.67kg/m ²)							
Declared life cycle stage		Product stage	End of life stage				Benefits and loads beyond the system boundary
Indicator	Unit	A1-A3	C1	C2	C3	C4	D
GWP	[kg CO ₂ -eq.]	-7.86E+00	0.00E+00	2.26E-02	1.26E+01	0.00E+00	-7.05E+00
ODP	[kg CFC11-eq.]	9.96E-08	0.00E+00	6.04E-18	1.95E-15	0.00E+00	-1.16E-13
AP	[kg SO ₂ -eq.]	3.61E-02	0.00E+00	6.97E-05	1.25E-04	0.00E+00	1.30E-02
EP	[kg N-eq.]	8.40E-03	0.00E+00	5.78E-06	1.22E-05	0.00E+00	-1.72E-04
POCP	[kg O ₃ -eq.]	5.88E-01	0.00E+00	1.52E-03	1.75E-03	0.00E+00	7.64E-02
ADPF	[MJ]	6.65E+00	0.00E+00	4.37E-02	4.95E-02	0.00E+00	-1.08E+01

Caption

GWP – total = Global warming potential – total; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of soil and water; EP – Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPF - Abiotic depletion potential for fossil resources

.LEED v4.1 credits with regard to environmental product information



LEED BD+C: New Construction v4.1 - LEED v4.1
Construction and Demolition Waste Management Planning
Required

Intent

To reduce construction and demolition waste disposed of in landfills and incineration facilities by recovering, reusing, and recycling materials, and conserving resources for future generations. To delay the need for new landfill facilities that are often located in frontline communities and create green jobs and materials markets for building construction services.

Admonter solid timber multi-layer products represent a suitable target for diversion of resources from landfill. As a result, the waste diversion goals for the project may identify Admonter products as one of the materials targeted for diversion and state this in the final report accordingly.

Section 2.9 of the environmental product declaration of Admonter solid timber multi-layer products present details for the product's construction phase. In addition section 2.14 indicates details for the product's re-use phase. Referring information are compliant with the intent to promote resource efficiency via the effective and appropriate management of construction waste. Aspects described in the EPD should be considered:

EPD | chapter 2.9 | packaging

Packaging consists of cardboard, polyethylene (PE) film and PET straps. Packaging materials must be collected separately and recycled in accordance with local legal requirements. If wooden pallets are used they can be reused or recycled as waste wood prior to thermal utilization.

EPD | chapter 2.14 | re-use phase

Floating laid multi-layer parquet can be reused for similar applications. If reuse is not possible, it represents material for recycling. The thermal treatment of the product represents the least favourable alternative for the product's end of life remaining the last choice if neither would re-use nor recycling be possible.



LEED BD+C: New Construction v4.1 - LEED v4.1
Building Life-Cycle Impact Reduction
Possible 5 points

Intent

To encourage adaptive reuse and optimize the environmental performance of products and materials.

Option 1. Building and material reuse

According to Option 1, Admonter products can be included in the calculation of the percentage of surface area reused or salvaged. Building materials such as structural elements (floors) or installed interior elements shall explicitly be included in the calculation.

Attention: Reuse materials contributing toward this credit may not contribute toward MR credit-Sourcing of Raw Materials!

Option 2. Whole-building life-cycle assessment

The environmental product declaration presents product specific values, which can directly be used for the life cycle assessment of the whole project. Given results are compliant with *ISO 14044* (and *EN 15804*) and report all listed impact categories.



LEED BD+C: New Construction v4.1 - LEED v4.1

Environmental Product Declarations

Possible 2 points

Intent

To encourage the use of products and materials for which life-cycle information is available and that have environmentally, economically, and socially preferable life-cycle impacts. To reward project teams for selecting products from manufacturers who have verified improved environmental life-cycle impacts.

Option 1. environmental product declaration

Admonter solid wood multi-layer products meet the following disclosure criteria:

- Environmental product declaration which complies with *ISO 14025, 14040, 14044* and *EN 15804+A2* with a cradle-to-gate scope with modules (Module A1-A3, Modules C1-C4 and Module D declared).
- Product-specific Type III EPD - Products with third-party certification (Type III), including external verification in which the manufacturer is explicitly recognized as the participant by the program operator are valued as one whole product for purposes of credit achievement calculation.



LEED BD+C: New Construction v4.1 - LEED v4.1

Sourcing of Raw Materials

Possible 2 points

Intent

To encourage the use of products and materials for which life cycle information is available and that have environmentally, economically, and socially preferable life cycle impacts. To reward project teams for selecting products verified to have been extracted or sourced in a responsible manner.

Product information for Admonter solid wood multi-layer products within this credit:

Responsible sourcing of raw materials		Description
Wood products certified by Forest Stewardship Council or USGBC-approved equivalent	yes	Forest Stewardship Council (FSC) Certificate Number FSC HFA-COC-100143 Date of first issuance: 31.03.2015 Date of issuance: 31.03.2021 Valid to: 30.03.2026
		Programme for the Endorsement of Forest Certification Schemes (PEFC) Certificate Number HFA-COC-0147 Date of first issuance: 28.08.2003 Date of issuance: 01.10.2019 Valid to: 30.09.2024
Recycled content element		No secondary wood is used to produce Admonter solid wood multi-layer products.

The production of Admonter solid wood multi-layer products takes place in Admont, Austria. In case your project is located within a radius of 100 miles from the Admont site, please contact Admonter for additional information <https://admonter.com/en>.



LEED BD+C: New Construction v4.1 - LEED v4.1

Material Ingredients

Possible 2 points

Intent

To encourage the use of products and materials for which life-cycle information is available and that have environmentally, economically, and socially preferable life-cycle impacts. To reward project teams for selecting products for which the chemical ingredients in the product are inventoried using an accepted methodology and for selecting products verified to minimize the use and generation of harmful substances. To reward raw material manufacturers who produce products verified to have improved life-cycle impacts.

Product information for Admonter solid wood multi-layer products within this credit:

Option 2.

Material ingredient optimization

International Alternative Compliance Path – REACH Optimization	All ingredients comply with REACH requirements (date 19.01.2021), no other cancerogenic, mutagenic, reprotoxic (CMR) substances of category 1A or 1B that are on the ECHA candidate list, above 0.1 % by mass, see EPD section 2.5
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Download area for product data sheets: <https://admonter.com/en/downloads/>

Additional useful information regarding this credit:

Admonter solid wood multi-layer products are designed for indoor use. Compliance with the TÜV PROFiCERT Premium Guideline of TÜV Hessen ensures that Admonter solid wood multi-layer products do not emit unnatural emissions into the indoor air of buildings. The ongoing, independent monitoring by EPH Dresden proves that the emissions stay far below legal limit values.

According to the TÜV PROFiCERT-Premium-certificate (certificate registration no. 70 710 5616-1, certificate valid from 2020-08-07 to 2023-08-06) the product fulfils the following standards and labels:

- Requirements of the French VOC-Ordinance (class A+, regulation March and April 2011),
- the AgBB (Committee for health-related evaluation of building products) schema,
- the Belgian VOC regulations,
- the BLUE ANGEL (RAL UZ 176),
- Austrian Environmental Label Guideline UZ 07
- Annex 8 MVV TB / ABG
- BREEAM International New Construction 2016 and LEED v4
- Finnish M1 classification



LEED BD+C: New Construction v4.1 - LEED v4.1
Construction and Demolition Waste Management
Possible 2 points

Intent

To reduce construction and demolition waste disposed of in landfills and incineration facilities through waste prevention and by reusing, recovering, and recycling materials, and conserving resources for future generations. To delay the need for new landfill facilities that are often located in frontline communities and create green jobs and materials markets for building construction services.

Option 2. Waste prevention

Admonter solid wood multi-layer products can be re-used as stated in chapter 2.14 of the environmental product declaration resulting in less construction waste. Secondly, Admonter products should be recycled rather than thermally treated, which represents the least preferable option at end-of-life.



LEED BD+C: New Construction v4.1 - LEED v4.1
Low-Emitting Materials
Possible 3 points

Intent

To reduce concentrations of chemical contaminants that can damage air quality and the environment, and to protect the health, productivity, and comfort of installers and building occupants.

Product information for Admonter solid wood multi-layer products within this credit:

Item	Value	Unit
Test Institute	EPH Dresden, Entwicklungs- und Prüflabor Holztechnologie GmbH	-
Report no.	2117131/2020/1/W	-
Test method	Test chamber method	-
Relevant regulation	AgBB, ISO 16000	-
Requirements met	yes	-
TVOC (C6 C16) (28 days)	86	µg/m ³
Sum SVOC	< 5	µg/m ³
Formaldehyde	< 5	µg/m ³
R (dimensionless)	< 1	-
VOC (without NIK)	< 5	µg/m ³
Cancerogenic substances	Not detectable	

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- the Belgian VOC regulations,

- the BLUE ANGEL (RAL UZ 176),
- Austrian Environmental Label Guideline UZ 07
- Annex 8 MVV TB / ABG
- BREEAM International New Construction 2016 and LEED v4
- Finnish M1 classification

According to EPD chapter 2.5 all ingredients comply with REACH requirements (date 19.01.2021), no other cancerogenic, mutagenic, reprotoxic (CMR) substances of category 1A or 1B that are on the candidate list, above 0.1 % by mass.

Disclaimer: The content of, and results shown in this fact sheet are based on data and information submitted by the client. Therefore, Daxner & Merl GmbH makes no representation or warranty in regard of the correctness or completeness of the content of this document or the results shown.

.References

EN 717-1: EN 717-1:2005-01, Wood-based panels - Determination of formaldehyde release - Part 1: Formaldehyde emission by the chamber method.

EN 15804: DIN EN 15804:2012+A2:2019, Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products.

EN 13353: DIN EN 13353:2008-11 + A1:2011-05, Solid wood panels (SWP) – Requirements.

EN 13489: DIN EN 13489:2002, Wood and parquet flooring - Multi-layer parquet elements.

EN 13986: DIN EN 13986+A1:2015-04, Wood-based panels for use in construction - Characteristics, evaluation of conformity and marking.

EN 14342: DIN EN 14342:2013-09, Wood flooring - Characteristics, evaluation of conformity and marking.

ISO 14025: DIN EN ISO 14025:2011-10, Environmental labels and declarations - Type III environmental declarations - Principles and procedures.

ISO 14040:2006-07, Environmental management - Life cycle assessment - Principles and framework.

ISO 14044: DIN EN ISO 14044:2006-10: Environmental Management - Life Cycle Assessment - Requirements and Guidelines.

ISO 15686:2011-05, Buildings and constructed assets - Service life planning.

ISO 16000-3: DIN ISO 16000-3:2011, Determination of formaldehyde and other carbonyl compounds in indoor air and test chamber air - Active sampling method.

ISO 16000-9: DIN ISO 16000-9:2006, Determination of the emission of volatile organic compounds from building products and furnishing - Emission test chamber method.

Additional CE information: <https://admonter.com/en>

AgBB, board for the health evaluation of building products, German Federal Environmental Agency, Wörlitzer Platz 1, 06844 Dessau-Roßlau.

EPH Dresden, Test report: no. 2117131/2020/1/W.

FSC-certificate: Forest Stewardship Council (FSC) Certificate Number FSC. Certification No.: HFA-COC-100143 (Date of first issuance: 31.03.2015; Date of issuance: 31.03.2021; Valid to: 30.03.2026)

PEFC-certificate: Programme for the Endorsement of Forest Certification Schemes (PEFC). Certificate No.: HFA-COC-0147 (Date of first issuance: 28.08.2003; Date of issuance: 01.10.2019; Valid to: 30.09.2024).

TÜV PROFiCERT-Premium: TÜV PROFiCERT-product Interior (PREMIUM). Certificate no. 70 720 56161. TÜV Technische Überwachung Hessen GmbH, Robert-Bosch-Straße 16, D 64293 Darmstadt.

U.S. Green Building Council, 2018. LEED v4.1 for Building Design and Construction.